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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,830	04/21/2004	Matthias Sieverding	SIEVERDING	5292

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HENRY M FEIEREISEN, LLC
350 FIFTH AVENUE
SUITE 4714
NEW YORK, NY 10118

EXAMINER	
COOLEY, CHARLES E	
ART UNIT	**PAPER NUMBER**
1723	

DATE MAILED: 10/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/828,830	SIEVERDING ET AL.	
	Examiner	Art Unit	
	Charles E. Cooley	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-9,12 and 13* is/are allowed.

6)☒ Claim(s) *10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ___.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FINAL OFFICE ACTION

Priority

1. Acknowledgment is made of applicant's claim for priority based on an application filed in Germany on 23 OCT 2001. It is noted, however, that applicant has not filed a certified copy of the application as required by 35 U.S.C. § 119.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0892254 A1 in view of Hawley (US 5,185,117).

EP 0892254 A1 discloses a fiber feeder for feeding a mixing apparatus comprising a weighing plate 8; fiber guide unit 1 and/or 3 fixed to the weighing plate 8 for removing and conveying fibers from a take-off or loading unit (col. 2, lines 3-11 and col. 3, lines 50-52). EP 0892254 A1 thus discloses that a source of fibers are loaded into the fiber feeder but does not disclose the particular take-off unit or source of fibers that are ultimately loaded into the fiber feeder. Hawley '117 shows a device for feeding fibers into an extruder 8 including spools or drums 64 of fiber material disposed on a scale 68, 70 which fibers are processed by rollers 74, 76 and loaded into a hopper receptacle 82.

More specifically, the patent to Hawley '117 discloses the compounding of thermoplastic resin with reinforcing fibers in a multiple extruder system in such a way as to produce measured preforms of a predetermined size and shape consisting of discontinuous lengths of reinforcing fibers randomly dispersed in thermoplastic resin. A further objective is to provide a blended mixture of thermoplastic resin with reinforcing fibers wherein the structural integrity of the discrete fibers is maintained in lengths preferably of one inch or more.

These basic objectives are realized by utilizing two separate extruders comprising a first, resin extruder and a second, compounding extruder. Discrete, predetermined lengths of reinforcing fibers are introduced into a first inlet port of the compounding extruder from a suitable source of supply. Thermoplastic resin pellets

introduced into the resin extruder by pellet-handling apparatus are heated and melted therein, and forced under pressure into a second inlet port of the compounding extruder. The action of the power screw of the compounding extruder produces as an extrudate a molten mass of thermoplastic resin having discrete, discontinuous lengths of reinforcing fibers randomly dispersed therein.

As a particularly advantageous feature, the aforesaid second inlet port on the compounding extruder for receiving heated, thermoplastic resin is located along the length of the power screw of the compounding extruder at a location downstream from the first inlet port, into which the reinforcing fibers are introduced, with respect to the direction of fiber and resin flow through the compounding extruder. As a result, the fibers will be heated and mechanically worked by the power screw of the compounding extruder before coming into mixing contact with the molten, thermoplastic resin. This enhances the penetration and coating of the fibers by the thermoplastic resin and reduces fiber degradation at the moment of contact, which would otherwise occur if the thermoplastic resin were in a more viscous state.

A further, particularly beneficial aspect of the compounding process and apparatus resides in the weight-controlled supply of thermoplastic resin and fibers to the compounding extruder. The aforesaid pellet-handling apparatus comprises weighing and conveying apparatus which is constructed and arranged to feed thermoplastic resin pellets into the resin extruder inlet at a predetermined rate weight. Moreover, the reinforcing fibers are also introduced from a supply source which is also weight-controlled in order to carefully monitor and control the weight rate at which the fibers are

fed into the compounding extruder. Such a supply source may preferably comprise packages of continuous fiber strands from which the fibers are pulled and cut into desired, discrete lengths. The weight-controlled supply of the thermoplastic resin and reinforcing fibers can be preferably accomplished by loss-in-weight devices utilized in combination with the supply sources of the resin pellets and reinforcing fibers. By carefully controlling the raw material feeding system, the desired weight ratio of the blended mixture of thermoplastic resin and long reinforcing fibers can be achieved on a consistent basis.

The aforesaid apparatus and process is preferably utilized in a compression-molding process wherein the extrudate from the compounding extruder is fed directly into a preformer. The preformer produces a compression-molding preform of desired weight which may be directly conveyed to the molding cavity of a compression molding machine. Alternately, the compounding extrudate may be formed as sheets suitable for subsequent use as a molding material.

With reference to FIGS. 1-3 of the drawings, reference numeral 1 generally indicates the extruding apparatus for compounding reinforcing fibers with a thermoplastic resin material. Such apparatus may be utilized in combination with a compression-molding machine as generally indicated by reference numeral 2. As is hereinafter set forth, a preform produced from the molten extrudate discharged from the extruding apparatus and comprising a mixture of thermoplastic resin with reinforcing fibers may be conveyed to the molding machine 2 for molding an article of desired size and shape.

The extrusion apparatus is comprised of a resin extruder 4, and a compounding extruder 8 connected together in fluid flow relationship in a particularly advantageous manner as hereinafter described. The resin extruder has connected to it a source of supply of thermoplastic resin material, generally indicated by reference numeral 6; and a source of supply of reinforcing fibers indicated by reference numeral 10 is connected to the compounding extruder.

The resin extruder 4 comprises an elongated, rotatable mechanical screw 12 contained within the barrel or housing 14 of resin extruder 4. Screw 12 extends lengthwise through barrel 14 between an inlet port 16 and an outlet connection 18, as is best shown in FIG. 3. As is also shown in FIG. 3, an electrical heater 20 may be utilized around the barrel 14 of extruder 4 to provide supplementary heat, in addition to that provided by the mechanical action of extruder screw 12, to assist in melting thermoplastic resin pellets introduced into extruder barrel 14 through inlet port 16.

As is indicated in FIG. 1, power screw 12 of extruder 4 may be driven by a motor 22, the output shaft of which may be connected to screw 12 by an appropriate power transmitting means 24, such as a belt drive in a conventional manner. Thermoplastic resin is supplied to extruder 4, preferably in pellet form from a drum or container 26. Any of a variety of thermoplastic resin materials may be utilized, among which by way of example, are included polypropylene, polyethylene, various nylons, polycarbonate, styrene, styreneacrylonitrile, acrylonitrile butadiene styrene, polysulfone, polyurethane, polyphenylenesulfide, acetal resins, polyesters, polyester elastomers, such as DuPont Hytrel brand, and various thermoplastic rubbers. A vacuum loader 30 is connected to

resin-pellet container 26 by way of a vacuum pickup tube 28 and serves to draw resin pellets from container 26 through tube 28 and to convey them into a thermoplastic dryer 32. Dryer 32 is of conventional design, and serves to dry the thermoplastic resin pellets to a desired level before they are conveyed into resin extruder 4. The final conveying of the pellets into extruder 4 is accomplished by way of a feeder conveyor 36, for example, in belt form as shown, and comprising a part of a loss-in-weight feed scale assembly 34. Various types of pellet conveyors may be used, including augers. All of the aforesaid pellet supply apparatus comprises pellet-handling means for conveying thermoplastic resin pellets from supply drum 26 to extruder 4, the discharge of resin pellets from belt conveyor 36 being directed into a final supply hopper 38, as shown in FIGS. 1 and 2. The bottom, discharge end of hopper 38 is connected to inlet port 16 of extruder 4. The feeder/scale assembly 34 is initially programmed to deliver thermoplastic resin pellets at a desired weight rate of flow into resin extruder 4. The scale is computer controlled.

Resin extruder 4 is mounted on a base plate 48, and its outlet connection or fitting 18 is connected to an adapter conduit 40 as shown in FIGS. 2 and 3. Adapter conduit 40 is connected in fluid-flow communication between outlet connection 18 on the discharge end of resin extruder 4 and an inlet fitting 42 provided on compounding extruder 8 on inlet end section 8a. An internal flow passage 44 within adapter conduit 40 is positioned to receive the extrudate discharged through outlet connection 18 of extruder 4. A similar, internal flow passage 46 within inlet fitting 42 communicates with flow passage 44 of adapter conduit 40 and has a discharge end 46a which serves as an inlet port to the inlet end 8a of compounding extruder 8.

The mechanical action, including friction, generated by power screw 12 of resin extruder 4 on the thermoplastic resin pellets, coupled with the heat from supplemental heater 20, serves to melt the thermoplastic resin pellets within the barrel 14 of extruder 4. The thermoplastic resin thus leaves extruder 4 through its outlet connection 18 in the form of a molten mass in a fluid state, and is conveyed under the pumping action of extruder screw 12 through adapter conduit 40 into compounding extruder 8 through inlet port 46a.

Compounding extruder 8 has a barrel or housing 50 within which is contained an elongated, power screw 52 extending from inlet end 8a to outlet or discharge end 8b of extruder 8. A supplemental electric heater 54 may also be utilized as shown in FIG. 3 in embracing relation to the housing of compounding extruder 8.

Compounding extruder 8 is supported on a base pad or plate 60, which also carries a drive motor 56 and power transmitting means 58 for providing rotary power to extruder screw 52 of compounding extruder 8. As with resin extruder 4, the power transmitting means 58 is contained within a housing as shown, and is connected to the output shaft of drive motor 56. Such a power-transmitting means may take various forms, including that conventional belt drive.

Compounding extruder 8 has a first inlet port 62 on inlet end 8a, which is positioned upstream of molten resin inlet port 46a with respect to the direction of material flow through extruder 8, for reasons hereinafter set forth.

The source of supply 10 of reinforcing fibers is connected to first inlet port 62. The source or supply of reinforcing fibers may take various forms. It is only essential

that the reinforcing fibers be supplied to compounding extruder 8 as discrete lengths of reinforcing fibers of a predetermined length, preferably in excess of one inch at a controlled rate. For that purpose, the supply source of reinforcing fibers may preferably comprise a pair of rolls 64 held within a pair of dispensing containers or packages 66 as shown in FIGS. 1 and 2. The fiber supply rolls 64 and their container 66 are positioned on a base plate 68 forming a component of a loss-in-weight scale 70 indicated in FIG. 1. Continuous lengths of reinforcing fibers 72 drawn from rolls 64 are guided between a pair of friction rollers 74 which serve to pull continuous lengths of fibers from supply rolls 64. A cut-off roller 76 is provided with a plurality of cut off blades 78. These blades serve to sever the continuous strands of fiber 72 at predetermined intervals, so as to cut the reinforcing fiber to discrete, predetermined lengths. The separate, discrete lengths of reinforcing fibers are directed into hopper 82 of a cram feeder 80 having a feed auger 84. As shown in FIGS. 1 and 2, feed auger 84 is driven by a drive motor 86 having a gear reduction unit. Rotating auger 84 serves to cram or force-feed the discrete lengths of reinforcing fibers through first inlet port 62 into the inlet end 8a of compounding extruder 8.

As with the loss-in-weight scale 34 utilized for the introduction of resin pellets into extruder 4, loss-in-weight scale 70 is computer programmed so as to permit the feeding of reinforcing fibers at a desired weight rate through cram feeder 80 into inlet port 62 of compounding extruder 8. To that end, the rotational speed of fiber feed rollers 74 is controlled by signals received from the loss-in-weight scale 70. In this way, rollers 74 rotate at a predetermined speed so as to pull continuous fiber strands 72 from supply

packages 66 at a desired speed for cutting into discrete lengths by blades 78. A computer 75 is shown schematically in FIG. 1 for receiving weight feed signals from scales 34 and 70 and delivering feed control signals to regulate the speed of conveyor 36 as well as the speed of feed rollers 74. Computer 75 is initially programmed to provide the predetermined formulation of resin and fiber, e.g., 60% resin and 40% fiber by weight in the extrudate, as well as to control the desired total weight input of fiber and resin in pounds per time interval.

Within compounding extruder 8, the molten thermoplastic resin and the discrete lengths of reinforcing fibers are mixed and compounded intimately in order to form a homogeneous mass. The molten mass of thermoplastic resin having discrete, discontinuous lengths of reinforcing fibers randomly dispersed therein is formed in the barrel 50 of compounding extruder 8 by the mechanical action of power screw 52 and pumped to the discharge end 8b of extruder 8 by screw 52 as extrudate. The fibers within the molten extrudate discharged from compounding extruder 8 are preferably of a length greater than one inch, to thus provide maximum mechanical strength enhancement to articles which are molded from such extrudate. The extrudate discharged from output end 8b of extruder 8 may preferably be directed into a preforming device for forming the molten mixture of thermoplastic resin and reinforcing fibers into a predetermined size and shape to be used as a preform in a molding machine.

Particular advantages and benefits are realized by locating the inlet port 46a for the introduction of molten thermoplastic resin into compounding extruder 8 at a location

along the length of power screw 52 which is downstream from the first inlet port 62 through which reinforcing fibers are received. The term downstream refers to the direction of fiber and molten thermoplastic resin flow through compounding extruder 8 from its inlet end 8a to its discharge end 8b. As a result of this particular input arrangement for the molten mass of thermoplastic and the precut lengths of reinforcing fibers, the fibers will be heated and mechanically worked by power screw 52 along the inlet end 8a of extruder 8 before coming into mixing contact with the molten thermoplastic resin. As a result, the penetration and coating of the individual filaments making up the strands or bundles of each length of fiber will be greatly enhanced. Also, since the fibers will have been preheated along the inlet end of compounding extruder 8, they will not cool the heated thermoplastic resin and increase its viscosity. The higher the viscosity of the thermoplastic resin, the greater the propensity for degradation and breaking up of the reinforcing fibers at the moment of contact. As noted above, the extruder mixture of molten thermoplastic resin and discrete lengths of reinforcing fibers discharged from compounding extruder 8 may be directed into a preforming device, such a device being indicated generally by reference numeral 88 in FIGS. 1, 2, and 3.

The preforming device may take various forms, depending upon the particular type and shape of preform desired for a molding operation. If a log or billet-shaped preform is desired, of generally cylindrical shape, an extruding preformer comprised of a barrel or housing 90 and having a power screw 92 may be utilized. Such an extruder is provided with a drive unit 94 comprising a motor and a power transmission means for providing rotary power to screw 92 as well as reciprocal movement. An external heater

96 may also be utilized around the outside of preform extruder housing 90. An adapter fitting 98 formed with a converging internal passage 100, is preferably utilized to force the homogeneous mixture of molten thermoplastic resin and long, chopped reinforcing fibers into a side port 102 of preformer extruder housing 90. Adapter 98 is connected as shown between the outlet or discharge and 8b of barrel 50 of compounding extruder 8 and side port 102 of preformer extruder housing 90. At the discharge end of extruder barrel 90, a preform chamber 104 is provided. Preferably, extruder screw 92 not only rotates, but is provided with a drive arrangement which reciprocates it back and forth along the length of extruder barrel 90, as indicated by the directional arrows in FIG. 3. A cut off knife 106 is provided across the discharge end of extruder housing 90. In operation, the rotational movement of extruder screw 92 forces molten extrudate received through adapter fitting internal passage 92 into preform chamber 104 to form a log or billet-shaped preform against the cut off knife 106. Cut off knife 106 is then raised vertically, and power screw 92 reciprocates forwardly towards preform chamber 104 so as to force a billet-shaped preform out onto a shuttle plate 108. Knife 106 is then actuated to move downwardly and cut off the preform billet to the desired length. The rotation of screw 92 causes a pressure build-up within chamber 104, in response to which screw 92 then reciprocates rearwardly to receive another charge of molten, preform extrudate from the discharge end of compounding extruder 8. Shuttle plate 108 may be arranged to reciprocate laterally back and forth on conveyor means generally indicated by reference numeral 109 in FIGS. 1 and 2. Such an arrangement is used where it is desired to provide the compounding apparatus and the preformer in direct

association with a molding machine indicated by reference numeral 2 for direct, combined operation by a molder. The molding machine 2 indicated generally in FIGS. 1 and 2 is a compression molding machine comprised of a compression press 110 carrying a male mold-head 112 adapted to be received within a molding cavity 114. Compression press 110 is reciprocated upwardly and downwardly on guide rods 118 by a reciprocating power cylinder 116.

Thus, the preform molding material comprised of a log or billet received from preformer 88 on shuttle plate 108 is deposited into mold cavity 114. Thereafter, the mold press is operated to compress the molding material into the desired shape. The shuttle plate 108 is then conveyed back laterally on the conveyor means 109 to the position shown in FIGS. 1 and 2 to receive a further preformed log or billet from the discharge end of preformer 88. The conveyor means 109 may be any type of conveyor, such as a roller or belt conveyor.

In some instances, it may be desirable to form the extrudate of thermoplastic resin and reinforcing fibers from compounding extruder 8 into the shape of a sheet. Such a sheet product could be utilized for compression molding as a thermoplastic, sheet-molding compound (TP-SMC). In order to accomplish this, the preform device or equipment would comprise a pair of calendering rollers 130 and 132 which are spaced apart a predetermined distance to form a nip 134 to shape sheets of the desired thickness. The rotatably mounted rollers 130 and 132 are disposed adjacent to a special adapter fitting 136 affixed to the discharge end 8b of compounding extruder 8 as shown in FIG. 5. Adapter fitting 136 is actually a sheet-forming die and has an internal passage

138 converging at its outer end to the shape of a slot 139 of the desired length for forming sheets from the extrudate forced from the discharge end of compounding extruder 8 by power screw 52. A sheet formed in such a manner is indicated by reference numeral 140. A reciprocating cut off knife 142 is mounted as shown at the output side of nip 134 between rollers 130 and 132 to cut off the sheets to the desired length. A receiving table or plate 144 is positioned to receive the sheets 140, with the rear edge of the table serving as a guide for cut off knife 142.

Those skilled in the art will appreciate that particular advantages flow from the multiple extruder apparatus and method disclosed herein for compounding thermoplastic resin with relatively long reinforcing fibers (over one inch in length) so as to make a molding preform. In addition to the particular benefits discussed above with respect to the use of a separate thermoplastic resin extruder 4 in combination with a compounding extruder 8 into which the thermoplastic resin is introduced in a molten state for mixture with reinforcing fibers introduced through a separate port, the use of a separate, resin heating and melting extruder 4 in combination with the compounding extruder 8, with the screws of the two extruders being independently driven, permits the screw speeds of the two extruders to be controlled independently of one another. The speed of the compounding extruder screw 52 may well not be the same as the speed of the resin-melting extruder screw 12. The extruders 4 and 8 are also of different sizes with respect to their internal diameters and lengths so that at maximum output speeds, the extrudate from resin extruder 4, together with the added fiber introduced through

port 62 into compounding extruder 8 will match the output rate of the compounding extruder 8.

The loss-in-weight scales 34 and 70, also known as gravimetric weight scales, ensure that thermoplastic resin pellets and chopped fibers are consistently and accurately supplied on a minute-to-minute basis over extended periods of time. The raw material feeding systems 6 and 10 are very important to the operation of the entire system so as to establish and maintain the proper blend of thermoplastic resin and reinforcing fibers. Once the extrudate has been formed from the compounding of the raw materials in compounding extruder 8, further blending of the extrudate is not possible.

The multiple extruder apparatus and method as disclosed herein brings particular operating efficiencies and cost savings to molding operations requiring a measured preform. The molder's raw material costs are significantly reduced, since he does not have to pay for the cost of precompounded pellets or sheet. The compounding takes place on the molding site as a continuous operation integral to the molding process. The system is also very flexible. The reinforcing fiber content can be varied as desired by the initial programming of the fiber feed system 10. Additives can be provided to the thermoplastic resin system prior to extrusion and various forms of reinforcement can be run alone or multiple reinforcements can be run to form a hybrid composite. This system also provides flexibility with respect to multiple sources of supply of reinforcing fiber materials. The molder can provide any particular fiber supply desired in fiber-supply packages 66, such as glass, carbon, etc. Hygroscopic resins can be easily handled and

dried, utilizing the dryer 32 described above with respect to the resin supply system 6. Also, the system keeps total control of the process for compounding thermoplastic resin materials and reinforcing fibers and making the preform in the hands of the molder.

Accordingly, since the fiber guide unit of EP 0892254 A1 must be supplied with fibers from some fiber supply source, it would have been obvious to one having ordinary skill in the art, at the time applicant's invention was made, to have provided EP 0892254 A1 with a source of fibers in the form of spools or drums as taught by Hawley '117 for the purpose of providing an adequate and virtually endless supply of fibers from conventional forms of fiber supplies such as spools or drums.

Allowable Subject Matter

5. Claims 1-9 and 12-13 are allowable over the prior art of record.

Response to Amendment

6. Applicant's arguments filed 12 SEP 2005 have been fully considered but they are not deemed to be persuasive.

With respect to Applicant's arguments that one skilled in the art would assert the secondary reference to Hawley cannot be bodily incorporated into the primary reference of EP 0892254 A1, the test for obviousness is not whether the features of the reference may be bodily incorporated into the other to produce the claimed subject matter but simply what the references make obvious to one of ordinary skill in the art. *In re Bozek*, 163 USPQ 545 (CCPA 1969); *In re Richman*, 165 USPQ 509 (CCPA 1970); *In re*

Beckum, 169 USPQ 47 (CCPA 1971); *In re Sneed*, 218 USPQ 385. The suggestion to modify the art to produce the claimed invention need not be expressly stated in one or all of the references used to show obviousness and instead may be an implied suggestion. *Cable Electric Products. Inc. v. Genmark, Inc.*, 770 F.2d 1015, 1025, 226 USPQ 881, 886 (Fed. Cir. 1985); *In re Sernaker*, 217 USPQ 1 (Fed. Cir. 1983); *In re Nilssen*, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988). It is not necessary that the references actually suggest, expressly or in so many words, the changes or improvements that applicant has made. Rather, the test for combining references is what the combined teachings of the references as a whole would have suggested to those of ordinary skill in the art. *In re Sheckler*, 168 USPQ 716 (CCPA 1971); *In re McLaughlin*, 170 USPQ 209 (CCPA 1971); *In re Young*, 159 USPQ 725 (CCPA 1968); *Cable Elec.*, 226 USPQ at 886-87. The motivation to combine can arise from the knowledge that the prior art elements will perform their expected functions to achieve their expected results when combined for their common known purpose. *Miles Lab., Inc. v. Shandon Inc.*, 27 USPQ2d 1123, 1128 (Fed. Cir. 1993). In the instant application, the secondary reference to Hawley makes obvious or suggests to one of ordinary skill in the art the provision of providing fibers to a fiber guide unit leading to a mixer/extruder in the form of conventional spools or drums.

While there must be some suggestion or motivation for one of ordinary skill in the art to combine the teachings of references, it is not necessary that such be found within the four corners of the references themselves; a conclusion of obviousness may be made from common knowledge and common sense of the person of ordinary skill in the

art without any hint or suggestion in a particular reference. *In re Bosek*, 416 F.2d 1385, 163 USPQ 545 (CCPA 1969). Further, in an obviousness assessment, skill is presumed on the part of the artisan, rather than the lack thereof. *In re Sovish*, 769 F.2d 738, 226 USPQ 771 (Fed. Cir. 1985).

With respect to the applied references, the examiner has considered all of the disclosure of each reference for what it would have fairly taught one of ordinary skill in the art. *In re Boe*, 355 F.2d 961, 148 USPQ 507 (CCPA 1966). Additionally, the specific teachings of each reference and the inferences which one skilled in the art would have reasonably been expected to draw from the disclosure has been taken into account. *In re Preda*, 401 F.2d 825, 159 USPQ (CCPA 1968). On the basis of the knowledge and level of skill in the art at the time of applicant's invention, as reflected by the applied references, the examiner concludes that the rejections under 35 U.S.C 103 are well founded.

Applying the test for obviousness set forth in *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981), which is what the combined teachings of the references would have suggested to those of ordinary skill in the art, the examiner concludes that one having ordinary skill in the art would have found it prima facie obvious to have provided a source of endless fibers to the fiber guide unit of EP 0892254 A1 in the form of conventional spools or drums that provide the endless fibers as taught by Hawley.

With respect to the argument that the prior art must contain something to suggest the desirability of the combination, it is noted that to justify combining reference teachings in support of a rejection under 35 U.S.C 103, it is not necessary that a device

shown in one reference be capable of being physically inserted into the device shown in the other or that the prior art suggest expressly the changes or possible improvements the applicant has made. It is only necessary that knowledge clearly present in the prior art was applied. *In re Keller*, supra; *In re Sernaker*, 702 F.2d 989, 217 USPQ 1 (Fed. Cir. 1983). The examiner has applied only knowledge clearly present in the prior art as evidenced by Hawley in the rejection of claim 10 and the rejection is considered proper.

Contrary to Applicant's position that there is no motivation to combine the references, the patent to Hawley provides sufficient motivation to utilize endless fibers from a spool or drum that are fed to a fiber guide unit to be ultimately fed into an extruder/mixer. The examiner notes that obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggesting, or motivation to do so found either in the reference or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Here, the patent to Hawley is deemed to provide sufficient motivation.

Since the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been prima facie obvious at the time the invention was made, to a person having ordinary skill in the art, from the combined teachings of the references, the rejections under 35 U.S.C 103(a) are considered proper.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION. ANY RESPONSE FILED AFTER THE MAILING DATE OF THIS FINAL REJECTION WILL BE SUBJECT TO THE PROVISIONS OF MPEP 714.12 AND 714.13.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E. Cooley whose telephone number is (571) 272-1139. The examiner can normally be reached on Mon-Fri. All official facsimiles should be transmitted to the centralized fax receiving number 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles E. Cooley
Primary Examiner
Art Unit 1723

5 October 2005